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EXAMINER

STAFIRA, MICHAEL PATRICK

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 04/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/029,080

Applicant(s)

SAKA ET AL.

Examiner

Michael P. Stafira

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claim 1,2,4-13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 6,476,921. Although the conflicting claims are not identical, they are not patentably distinct from each other because it would broaden the claimed limitations.

3. Claims 14-19 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 12-17 of prior U.S. Patent No. 6,476,921. This is a double patenting rejection.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. in view of Kim et al.

**Claim 1**

Lin et al. discloses a rotating polishing platen (Fig. 2, Ref. 14) having a first diameter and at least one window (Fig. 2, Ref. 40) formed in the polishing platen with it periodically scanned across a wafer (Col 7, lines 33-41). It is further obvious in a CMP process as taught in Lin et al. that the polishing pad is going to scan across the entire wafer so as to produce a uniform thickness on the wafer.

The reference of Lin et al. further discloses an optical detection system (Fig. 2, Ref. 30) carried on the platen for transmitting light through the window (40) and receiving light reflected from the wafer (Fig. 2, Ref. 16) through the window (40) as it rotates past the wafer (16) to detect the reflectance of material on the surface of the wafer (16) at the multiple localized zones (Col. 7, lines 33-65). It is obvious to one skilled in the art to know that a wafer in a CMP apparatus has multiple zones because a wafer is made-up of multiple circuits form on the wafer.

Lin et al. substantially teaches the claimed invention except that it does not show a wafer carrier for holding a wafer in cooperative relationship with the rotating platen, the carrier having multiple chambers that allow for independently varying pressure within the chamber the urge against the wafer at corresponding multiple localized zones on the wafer. Kim et al. shows that it is known to provide a wafer carrier (Fig. 3, Ref. 300) having multiple chambers (Fig. 3, Ref. 316) that allow for independently varying pressure with in the chamber etc... (Col. 8, lines 22-43) for a CMP apparatus. It would have been obvious to combine the device of Lin et al. with the

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wafer carrier of Kim et al. for the purpose of providing more accurate polishing of wafer surfaces and therefore increasing the uniform thickness of layers on the wafer.

**Claim 2**

Lin et al. discloses the reflectance is used to stop the polishing independently within each of the multiple localized zones (Col. 6, lines 50-67). It is obvious to one skilled in the art to know that in a CMP apparatus that the apparatus is going to stop polishing an area on a wafer when it reaches its programmed value.

**Claim 3**

Lin et al. further discloses the reflectance indicates the state of the polishing of the wafer within each of the multiple localized zones. It is obvious to one skilled in the art to know that in a CMP apparatus that the apparatus is going to indicate the state of the polishing of an area on a wafer so as to know that it has reached its programmed value.

**Claim 11**

The reference of Lin et al. further discloses material on the surface of the wafer is a barrier material ((Fig. 2, Ref. 18).

**Claim 12**

Lin et al. further discloses patterns are on the surface of the wafer (See Fig. 2, Ref. 28, Metal Feature).

**Claim 13**

The reference of Lin et al. further discloses that the window scans through the center of the wafer (See Fig. 3).

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3. Claims 5,6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watson ('211) in view of Kim et al. as applied to claim 1 above, and further in view of Takabayashi ('408).

**Claim 5**

Lin et al. in view of Kim et al. substantially teaches the claimed invention except that it does not show an the chambers formed in a flexible membrane and comprises a center chamber surrounded by one or more concentric chambers. Takabayashi ('408) shows that it is known to provide flexible chambers with a center chamber with one or more concentric chambers for a wafer holding apparatus (See Fig. 11). It would have been obvious to combine the device of Lin et al. in view of Kim et al. with the wafer holder of Takabayashi ('408) for the purpose of providing uniform holding power over a wafer with uneven surfaces.

**Claim 6**

Lin et al. in view of Kim et al. substantially teaches the claimed invention except that it does not show an the chamber comprise a center chamber and three annular, concentric chambers. Takabayashi ('408) shows that it is known to provide a center chamber with three concentric chambers for a wafer holding apparatus (See Fig. 11). It would have been obvious to combine the device of Lin et al. in view of Kim et al. with the wafer holder of Takabayashi ('408) for the purpose of providing uniform holding power over a wafer with uneven surfaces.

4. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al. in view of Kim et al. as applied to claim 1 above, and further in view of Chalmers ('922).

**Claim 7**

Lin et al. in view of Kim et al. substantially teaches the claimed invention except that it does not show a optical detection system that includes a fiber optic sensor having a bundle of transmit and receive optical fibers terminating at a sensor tip and having a light source transmitting light to the wafer and a photodetector which receives reflected light from the surface through the optical fibers. Chalmers shows that it is known to provide an optical detection system with optical fibers (Fig. 21(a) Ref. 12, 16) for the transmitting and receiving and having a tip (Fig. 21(a) Ref. 68) located next to the surface of the wafer (Col. 15, lines 56-62) for a CMP apparatus. It would have been obvious to combine the device of Lin et al. in view of Kim et al. with the fiber bundle of Chalmers for the purpose of providing the source and detector at a remote location so as to reduce the amount of background noise received by the detector from the polishing apparatus.

**Claim 8**

Lin et al. in view of Kim et al. substantially teaches the claimed invention except that it does not show a transmit and receive optical fiber oriented substantially normal to the surface of the wafer. Chalmers shows that it is known to provide an optical transmit and receive optical fiber (Fig. 21(a) Ref. 12, 16) oriented substantially normal to the surface of the wafer (Col. 15, lines 56-62) for a CMP apparatus. It would have been obvious to combine the device of Lin et al. in view of Kim et al. with the orientation of Chalmers for the purpose of providing the source and detector at a position to reduce the amount of background noise received by the detector from the surface of the wafer.

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**Claim 9**

Lin et al in view of Kim et al. discloses the claimed invention except for sensor tip is spaced from the wafer in the range of 200 to 250 mils. It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the range with Lin et al. in view of Kim et al., since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

**Claim 10**

Lin et al. in view of Kim et al. discloses the claimed invention except for the light source is a diode emitting light at 880 nm. It would have been obvious matter of design choice to combine Lin et al. in view of Kim et al. with the laser diode, since applicant has not disclosed that the laser diode solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the laser disclosed in Lin et al. in view of Kim et al.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Stafira whose telephone number is 703-308-4837. The examiner can normally be reached on 4/10.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 703-308-4881. The fax phone numbers for the



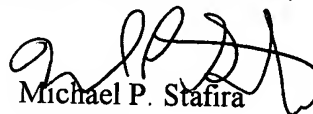
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organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Michael P. Stafira

Examiner

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April 15, 2003